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A new genus of Acrididae from Southern Africa (Orthoptera: Acridoidea)

by

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The new genus *Hemiloryma* is erected for the newly discovered type species *H. deserticola*, a widespread and endemic species of the subdesert and desert parts of South and South West Africa, which is associated with perennial grasses growing in steppe and wooded savanna vegetation types. The new taxon belongs to the little known group-*Loryma* which is defined and for which a key is provided.

HEMILORYMA gen. nov.

Type species: *Hemiloryma deserticola* spec. nov.

This genus is required for a newly discovered species, *Hemiloryma deserticola*, which in certain respects bridges the gap between *Loryma* Stål, 1878 and the more recent *Dirshacris* Brown, 1959. The principal distinguishing characters of the new genus are as follows.

Small with slightly fusiform habitus and shiny, slightly punctate, integument. Antenna filiform, somewhat thickened, shorter than combined lengths of head and pronotum. Head conical. Fastigium of vertex, from above, with parabolic obtuse apex, its surface convex. Frons sloping backwards, frontal ridge only developed in upper half, slightly expanded, its surface weakly concave and with thickened margins.

Pronotum sub-cylindrical, without median or lateral carinae and widening posteriorly; dorsum crossed by basal sulcus only, prozona 2,5 × length of metazona, latter with broadly incurved posterior margin. Prosternal tubercle spathulate, sloping backwards and with weakly bilobate apex. Mesosternal interspace about as wide as long; metasternal interspace triangular with deeply pitted sides. Elytra small, lobiform and located laterally, covering tympanum and extending back to second abdominal segment. Hind wing vestigial. Anterior and middle legs slender; hind femur short and robust with expanded lower margin and convex external surface covered with regular fish-bone reticulation; spurs of hind tibia with inner upper one strongly developed; external apical spine present, weakly developed. Tympanum large and open. Last abdominal tergite of male with pair of small, triangular-shaped, median projections. Supra-anal plate triangular, more rounded in male than female and with attenuate apex; male cercus expanded in basal half, becoming narrower and strongly incurved in apical half, apex sub-acute; female cercus short and conical. Male subgenital plate conical with obtuse apex, female subgenital plate flat, with median triangular projection. Ovipositor valves short, their apices weakly recurved, ventral pair with small rounded lateral projections.

Phallic complex: epiphallus bridge shaped with small, hooked, ancorae and large rounded lophi; oval sclerites long and narrow. Zygoma with short slender apodemes which diverge slightly apically. Arch of cingulum broad with narrow curved valves. Penis divided, basal parts straight, relatively stout and with broadened apices; apical parts of penis upcurved, with large membranous ventral lobes and tapering, slightly flared, apices. Gonopore process well developed.

Spermatheca with narrow apical and larger pre-apical diverticula, the latter recurved. Spermathecal duct narrow.

The new genus is very suggestive of *Loryma* in its general appearance, small lobiform elytra, open tympanum and similar markings, but is readily separated by characters such as the absence of pronotal carinae, stouter proportions of the hind femur and presence of median projections near the apex of the male abdomen. Another close relative appears to be *Dirshacris* which has a somewhat similar male cercus but differs in other respects such as the differently shaped pronotum, vestigial elytra and closed condition of the tympanum.

The subfamily Hemiacridinae, as defined by Dirsh (1956) and to which the new genus belongs, includes many diverse forms among which related groups may be distinguished. The trio of genera, *Loryma*, *Dirshacris* and *Hemiloryma*, constitute a distinct group reflecting natural relationship which may well be referred to as the *Loryma*-group whose members, for the moment at least, are monotypic. Species of the group are characterised by being small to medium sized and possessing lobiform elytra which may become strongly reduced and vestigial, by their spathulate prosternal process and by their distinctive male cerci which are large and compressed being either regularly curved or strongly incurved towards the apex. All the known species are restricted in their distribution to Southern Africa. The genus *Loryma* is apparently adapted to a winter rainfall climate and is found only in the South West Cape and Namaqualand. Both *Dirshacris* and *Hemiloryma* inhabit areas receiving a scanty summer rainfall, the former is more localised and so far, only recorded from the eastern Upper Karroo and Great Karroo whereas the latter is more extensively distributed across the Upper Karroo, Northern Cape and South West Africa. Because of their obvious close relationship and similar general appearance it is tempting to regard the new genus as the summer rainfall counterpart of *Loryma*. The component genera of the group may be distinguished as follows.

KEY TO GENERA IN THE GROUP-*LORYMA* STÅL

1 Small to medium sized grasshoppers; hind femur relatively slender; pronotum with median and lateral carinae strongly developed . . . . **Loryma** Stål
— Very small with shorter and broadened hind femur; only median pronotal keel sometimes present 2
2 Pronotum with median carina present; elytra reduced to vestiges; tympanum closed; apical part of male cercus erect . . . . **Dirshacris** Brown
— Pronotum without carinae; elytra lobiform, tympanum large, open; end of abdomen with small median projections; apical part of male cercus incurved, lying horizontally **Hemiloryma** gen. nov.

Hemiloryma deserticola spec. nov., figs. 1–10.

TYPE LOCALITY. South Africa, Cape Province, Middelburg.

MALE HOLOTYPE. Small with reduced lobiform elytra. Antenna filiform with 21 segments, weakly compressed and shorter than combined lengths of head and pronotum. Head conical. Fastigium of vertex, from above, parabolic with obtuse apex and weakly pitted convex surface; frons oblique, in upper half with weakly sulcate frontal ridge, slightly expanded between antennae and with distinct carinate margins. Facial carinulae weakly developed, excurved. Eyes large and wide.

Pronotum sub-cylindrical, median and lateral carinae absent, latter represented by two longitudinal ochreous stripes; dorsum crossed by basal sulcus only, its posterior margin broadly incurved, metazona much shorter than prozona; prosternal process spathulate, sloping backwards and with bilobate apex. Mesosternal interspace as long as broad. Elytra narrowly lobiform with indistinct venation and rounded apex, reaching back to second abdominal segment and covering tympanum; wing vestigial. Hind femur broad with expanded lower margin, upper basal lobe longer than lower one, outer surface convex with regular fish-bone reticulation. Hind tibia shorter than femur, inner upper spur almost twice as long as outer one. Tympanum large and open. Last abdominal tergite with pair of median triangular projections; supra-anal plate triangular with curved sides and small attenuate apical part; cercus compressed and widened in basal part, cylindrical and strongly incurved in apical part with sub-acute apex. Subgenital plate short and conical.

Epiphallus with narrow, slightly curved, bridge and small hooked ancorae; lophi large, broadly rounded, their surface shagreen; oval sclerites long and narrow. Apical valves of penis strongly upcurved, in middle with large lobiform swelling and narrow flared apex; basal valves slightly longer than apical ones, relatively robust with expanded and divergent apices; gonopore process relatively broad; zygoma with short slightly divergent apodemes.

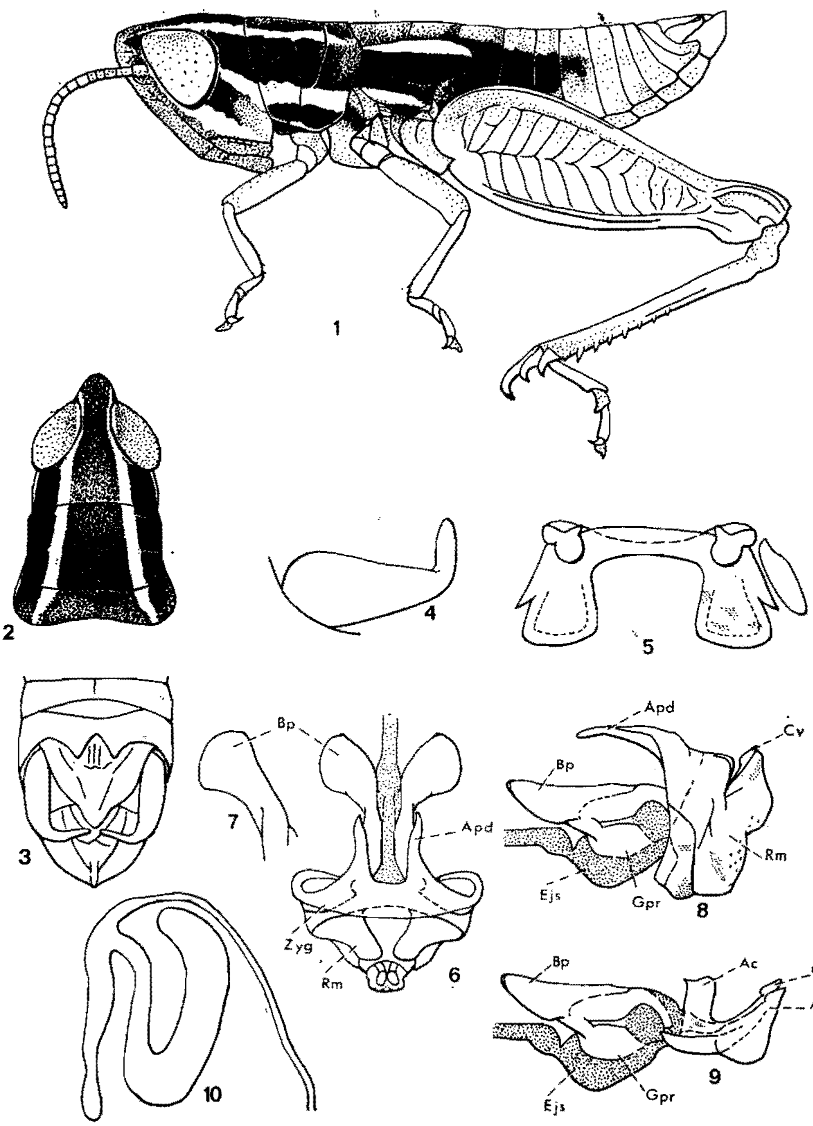
General body colour light to darkish brown with scattered black patches and conspicuous narrow ochreous stripes running across head, thorax and upper margin of elytron. Hind femur light brown with yellowish ventral surface; hind tibia and tarsus orange, tibial spines and spurs capped with black.

FEMALE PARATYPE. Very similar to male but larger and of a somewhat stouter habitus. Head less conical, frons more vertical and with broader fastigium of vertex. Frontal ridge flat, its surface finely pitted. Last abdominal tergite without median triangular projections; supra-anal plate triangular and more elongate than male, with straight sides and obtuse apex; cercus short and conical. Subgenital plate flat with triangular apex and upcurved sides; ovipositor valves short with weakly recurved apices, lower pair more slender and with rounded lateral projections. Spermatheca tubular and narrow with long sac-like pre-apical diverticula which is curved inwards.

General body colour light brown to straw coloured and with broad dark lateral stripe and narrow ochreous stripes, that of the elytron being most conspicuous, otherwise similar to male.

MEASUREMENTS. Length of body ♂ 8,9–13,9, ♀ 14,0–19,1; pronotum ♂ 1,7–2,8, ♀ 2,6–3,4; elytron ♂ 1,4–2,6, ♀ 2,1–3,1; hind femur ♂ 5,3–7,8, ♀ 7,5–9,6 mm.

MATERIAL EXAMINED. ♂-Holotype, 95 ♂- and 107 ♀-Paratypes with the following collection data: SOUTH AFRICA, Cape Province, 61 km SE. Upington, 12.ii.1959, 3 ♂, 1 ♀; 5 km W. Marydale, same date, 1 ♂; Middelburg, 30.iii.1959, 12 ♂, 17 ♀ (including the holotype) (all H. D. Brown); 40 km N. Kimberley, 3.xii.1960, 3 ♂, 1 ♀; 21 km N. De Aar, 4.xii.1960, 2 ♂, 2 ♀; 21 km S. Hopetown, same date, 1 ♂ (H. D. B., W. Furst and W. D. Haacke); 34 km NW. Kuruman, 7.ii.1961, 5 ♂, 2 ♀ (H. D. B);



Figs. 1–10. *Hemiloryma deserticola* gen. et spec. nov. 1–4. ♂-Holotype: 1, whole insect, lateral aspect; 2, head and pronotum, dorsal; 3, end of abdomen, dorsal; 4, right cercus, lateral but tilted upwards. 5–9. ♂-Paratypes: 5, epiphallus, dorsal; 6, phallic complex, dorsal; 7, detail of apex of basal part, showing variation; 8, phallic complex, lateral; 9, endophallus, lateral. 10. ♀-Paratype: spermatheca. Ac-arch of cingulum; Ap-apical valves of penis; Apd-apodemes; Bp-basal part of penis; Cv-valves of cingulum; Ejs-ejaculatory sac; Gpr-gonopore process; Rm-rami of cingulum; Zyg-zygoma.

5 km SW. Douglas, 2.iv.1961, 1 ♂, 17 ♀ (W. F. and F. Pick); 6 km E. Windsorton Road, 14.i.1963, 1 ♀ (H. D. B); 35 km N. Kimberley, 15.i.1963, 10 ♂, 14 ♀ (H. D. B., W. F. and M. J. D. White); Schuitdrift, NE. Pofadder, 6.iii.1969, 1 ♀ (H. D. B). SOUTH WEST AFRICA, 80 km S. Windhoek, 7.v.1959, 12 ♂, 12 ♀; 50 km SE. Karasburg, 15.ii.1961, 1 ♂ (both H. D. B.); 47 km NE. Aus, 14.v.1963, 1 ♀ (W. D. H.); Gross Tinkas water hole, Namib Park, 30.iv.1966, 9 ♂, 7 ♀; Langer Heinrich Mnt., Namib Park, 1.v.1966, 8 ♂, 5 ♀; Mooirivier Farm, Maltahöhe District, 4.v.1969, 1 nymph; Excelsior Farm No. 127, same district, 7.v.1969, 2 ♀; Uri-Hauchab Mnt., 12.v.1969, 4 ♂, 8 ♀; Awasib Mnt., 13.v.1969, 3 ♀; Mahlzeit Farm No. 232, 83 km NNE. Aroab, 9.ii.1970, 1 ♀; 50 km N. Okahandja, 4.iv.1970, 1 ♂ (all H. D. B.); Hardap Dam, nr. Mariental, 5.iii.1972, 4 ♂, 1 ♀; 32 km N. Grunau, 11.iii.1972, 3 ♀; 70 km W. Windhoek, 14.iii.1972, 11 ♂; 11 km SW. and 50 km SW. (Komuanab Farm No. 111) Otjimbingwe, 14–15.iii. 1972, 1 ♂, 1 ♀; 37 km S. Karibib, 15.iii. 1972, 1 ♀; 50 km W. Omaruru, 16.iii.1972, 2 ♂, 6 ♀ (all H. D. B., E. Koster and D. Wessels).

The holotype, together with numerous paratypes of both sexes deposited in the National Collection of Insects of the Plant Protection Research Institute, Pretoria; paratypes of both sexes also deposited in the insect collections of the following institutions: Transvaal Museum, Pretoria; South African Museum, Cape Town; State Museum, Windhoek; British Museum (Natural History), London; Academy of Natural Sciences, Philadelphia U.S.A.

VARIATION. As expected in such a wide ranging species there is variation between and within different populations. Specimens from the plateau areas of S. W. Africa are larger than those occurring in the Namib, whilst those from the Cape Province are intermediate in size. There is also slight variation in the relative lengths of the elytra, Namib specimens have shorter and more rounded elytra, inland the shape of the elytra becomes longer and narrower, but its length never exceeds the second segment of the abdomen. General body colour also varies, specimens from the S. W. African plateau are darker and also have redder hind legs, even the ventral surface of the femur in these specimens becomes suffused with red. Those from the Namib are all paler with the red often fading completely and the leg assuming a dusky hue. Certain of the above characters intergrade in a series indicating that they have little taxonomic value.

ECOLOGICAL NOTES. Geophilous and inhabiting sandy to rocky subdesert and desert habitats colonised by perennial bunch grasses. Areas from where they have been collected in the Karroo or in the Namib Desert may be classed as denuded steppe, whereas those in the central interior of S. W. Africa comprise wooded savanna with numerous trees such as *Combretum*, *Acacia* and *Terminalia* predominating. The tall grass cover with which they are invariably associated may grow either in scattered clumps, such as along the courses of the drainage lines, or occur in more extensive communities growing on the plains, between sand dunes or on rocky hill slopes. The particular grass species appears of secondary importance because different species are favoured in different parts of their geographic range, grasses such as *Eragrostis lehmanniana* and *Aristida diffusa* being favoured in the southern parts whereas species of *Stipagrostis*, especially *S. uniplumis*, and other species serving equally well elsewhere. In their dry or ripe state these grasses all have a similar general appearance and the structure of the tufts apparently satisfies the ecological needs of the grasshoppers. Both sexes can jump vigorously and when first encountered are to be found on the ground amongst the grass.

However, disturbed specimens will readily spring into nearby tufts, clinging to the culms with the body facing upwards or hiding within the foliage at the base. On the plants, their curious striped markings and straw-like colour closely matches the leafy background which is to be found at the base of the tufts. Despite their elusive habits and small size they are sometimes not uncommon. They are best collected with the aid of a net dropped over them while they are sitting on the ground. Adults appear some three to four weeks after the first rains and the species appears to be univoltine and adapted to areas receiving summer rainfall. The southern and eastern parts of their range, as well as the S. W. African uplands, receive an annual average rainfall of approximately 400 mm, but along the Orange River and the marginal Namib Desert this decreases to below 100 mm.

According to White (1963) the male chromosome set (based on Cytological Prep. Nos. A21–22, from 35 km N. Kimberley) comprises 23 acrocentrics, which is the normal complement for the family Acrididae.

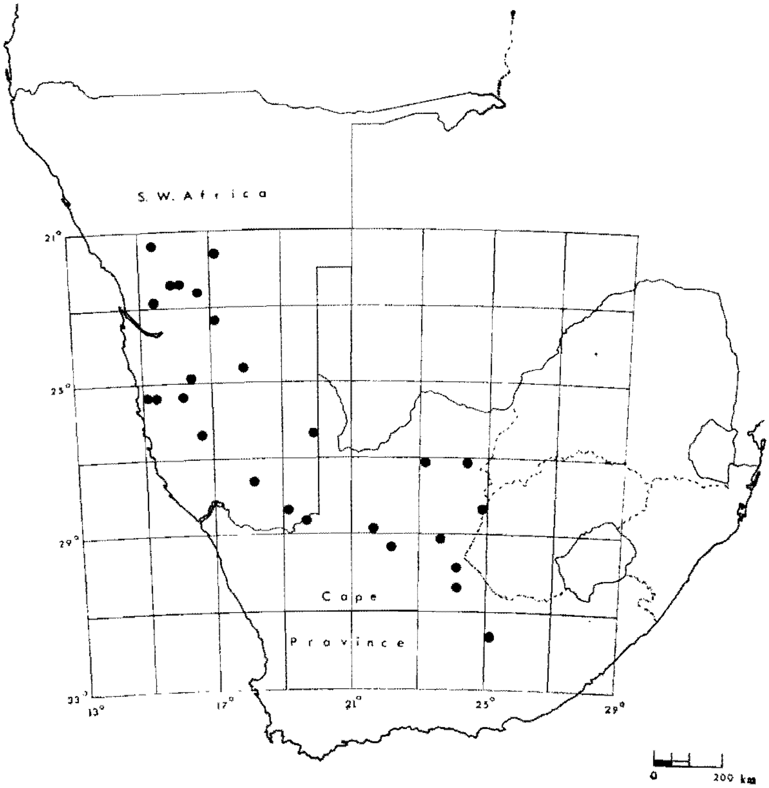


Fig. 11. Distribution of *Hemiloryma deserticola* gen. et spec. nov. in Southern Africa.

Distribution. The distribution of *H. deserticola* (Fig. 11), based on locality data listed under material examined, and using the quarter degree grid system, shows that the species is continuously and extensively distributed over the arid plateau areas of the Upper Karroo, southern Kalahari and central southern S. W. Africa. Ranging from Middelburg in the south, Kimberley in the east and northwards past Kuruman, and thence westwards across the plateau and along the S. W. African escarpment to north of Omaruru. Westwards, this species penetrates the Namib Plain on mountain outliers of the escarpment such as Uri-Hauchab Mountain and other prominent isolated peaks. It is unknown further south in the Great Karroo, South West Cape and Namaqaland nor does it range into the grasslands of the Orange Free State. In the far south at Middelburg C.P., its range overlaps with the related genus *Dirshacris*, the type locality of this species being only about a kilometre away from the present species. Their ecological requirements are however different, the other insect favouring denuded short grass communities as compared to the taller bunch grasses favoured by *H. deserticola.* The distribution of the new species coincides to a large extent with the South West Arid biotic zone proposed by Davis (1962) and provides yet another example of the highly autochthonous grasshopper element occupying this zone.

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